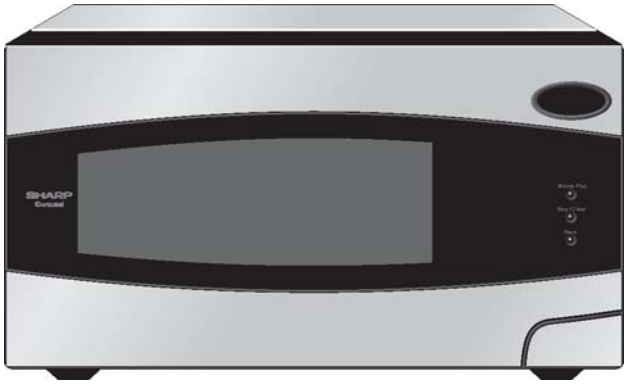
SHARP

SUPPLEMENTAL SERVICE MANUAL

S83M216R508HE



R-508HS

MICROWAVE OVEN

MODEL R-508HS

This is a supplemental Service Manual for Microwave Oven model R-508HS. This model is quite similar to the base models R-510HK/R-510HW; (S43M208R510HE).

This supplemental manual must be used in conjunction with the base model service manual for complete operation, service, safety and replacement parts information.

In the interest of user-safety the oven should be restored to its original condition and only parts identical to those specified should be used.

WARNING TO SERVICE PERSONNEL: Microwave ovens contain circuitry capable of producing very high voltage and current, contact with following parts may result in a severe, possibly fatal, electrical shock. (High Voltage Capacitor, High Voltage Power Transformer, Magnetron, High Voltage Rectifier Assembly, High Voltage Harness etc..)

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SHARP ELECTRONCS CORPORATION

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The contents are subject to change without notice.

Service Headquarters: Sharp Plaza, Mahwah, New Jersey, 07430-2135

PRECAUTIONS TO BE OBSERVED BEFORE AND DURING SERVICING TO AVOID POSSIBLE EXPOSURE TO EXCESSIVE MICROWAVE ENERGY

(a) Do not operate or allow the oven to be operated with the door open.
(b) Make the following safety checks on all ovens to be serviced before activating the magnetron or other microwave source, and make repairs as necessary: (1) interlock operation, (2) proper door closing, (3) seal and sealing surfaces (arcing, wear, and other damage), (4) damage to or loosening of hinges and latches, (5) evidence of dropping or abuse.
(c) Before turning on microwave power for any service test or inspection within the microwave generating compartments, check the magnetron, wave guide or transmission line, and cavity for proper alignment, integrity, and connections.
(d) Any defective or misadjusted components in the interlock, monitor, door seal, and microwave generation and transmission systems shall be repaired, replaced, or adjusted by procedures described in this manual before the oven is released to the owner.
(e) A microwave leakage check to verify compliance with the Federal Performance Standard should be performed on each oven prior to release to the owner.

BEFORE SERVICING

Before servicing an operative unit, perform a microwave emission check as per the Microwave Measurement Procedure outlined in this service manual.
If microwave emissions level is in excess of the specified limit, contact SHARP ELECTRONICS CORPORATION immediately @1-800-237-4277.

If the unit operates with the door open, service person should 1) tell the user not to operate the oven and 2) contact SHARP ELECTRONICS CORPORATION and Food and Drug Administration's Center for Devices and Radiological Health immediately.

Service personnel should inform SHARP ELECTRONICS CORPORATION of any certified unit found with emissions in excess of 4mW/cm^2. The owner of the unit should be instructed not to use the unit until the oven has been brought into compliance.

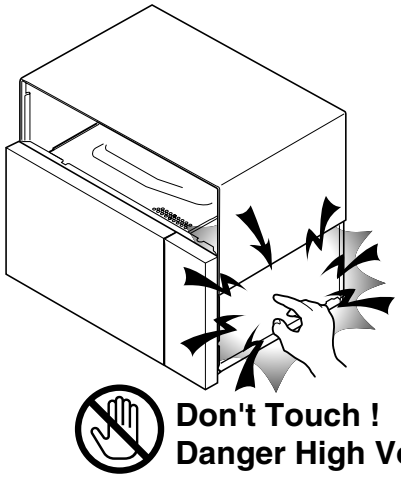
WARNING TO SERVICE PERSONNEL

Microwave ovens contain circuitry capable of producing very high voltage and current, contact with following parts may result in a severe, possibly fatal, electrical shock.

(Example)

High Voltage Capacitor, High Voltage Power Transformer, Magnetron, High Voltage Rectifier Assembly, High Voltage Harness etc..

Read the Service Manual carefully and follow all instructions.



Don't Touch !
Danger High Voltage

Before Servicing

1. Disconnect the power supply cord, and then remove outer case.
2. Open the door and block it open.
3. Discharge high voltage capacitor.

WARNING: RISK OF ELECTRIC SHOCK. DISCHARGE THE HIGH-VOLTAGE CAPACITOR BEFORE SERVICING.

The high-voltage capacitor remains charged about 60 seconds after the oven has been switched off. Wait for 60 seconds and then short-circuit the connection of the high-voltage capacitor (that is the connecting lead of the high-voltage rectifier) against the chassis with the use of an insulated screwdriver.

Whenever troubleshooting is performed the power supply must be disconnected. It may, in some cases, be necessary to connect the power supply after the outer case has been removed, in this event:

1. Disconnect the power supply cord, and then remove outer case.
2. Open the door and block it open.
3. Discharge high voltage capacitor.
4. Disconnect the leads to the primary of the power transformer.
5. Ensure that the leads remain isolated from other components and oven chassis by using insulation tape.
6. After that procedure, reconnect the power supply cord.

When the testing is completed,

1. Disconnect the power supply cord, and then remove outer case.
2. Open the door and block it open.
3. Discharge high voltage capacitor.
4. Reconnect the leads to the primary of the power transformer.
5. Reinstall the outer case (cabinet).
6. Reconnect the power supply cord after the outer case is installed.
7. Run the oven and check all functions.

After repairing

1. Reconnect all leads removed from components during testing.
2. Reinstall the outer case (cabinet).
3. Reconnect the power supply cord after the outer case is installed.
4. Run the oven and check all functions.

Microwave ovens should not be operated empty. To test for the presence of microwave energy within a cavity, place a cup of cold water on the oven turntable, close the door and set the power to HIGH and set the microwave timer for two (2) minutes. When the two minutes has elapsed (timer at zero) carefully check that the water is now hot. If the water remains cold carry out **Before Servicing** procedure and re-examine the connections to the component being tested.

When all service work is completed and the oven is fully assembled, the microwave power output should be checked and a microwave leakage test should be carried out.

MICROWAVE MEASUREMENT PROCEDURE

A. Requirements:

1) Microwave leakage limit (Power density limit): The power density of microwave radiation emitted by a microwave oven should not exceed 1mW/cm^2 at any point 5cm or more from the external surface of the oven, measured prior to acquisition by a purchaser, and thereafter (through the useful life of the oven), 5 mW/cm^2 at any point 5cm or more from the external surface of the oven.
2) Safety interlock switches:
   Primary interlock relay switch shall prevent microwave radiation emission in excess of the requirement as above mentioned. Secondary interlock relay and door sensing switch shall prevent microwave radiation emission in excess of 5 mW/cm2 at any point 5cm or more from the external surface of the oven.

B. Preparation for testing:
Before beginning the actual measurement of leakage, proceed as follows:
1) Make sure that the actual instrument is operating normally as specified in its instruction booklet.

Important:
Survey instruments that comply with the requirement for instrumentation as prescribed by the performance standard for microwave ovens, 21 CFR 1030.10(c)(3)(i), must be used for testing.

2) Place the oven tray in the oven cavity.
3) Place the load of 275±15 ml (9.8 oz) of tap water initially at 20±5^{O}C (68^{O}F) in the center of the oven cavity.
   The water container shall be a low form of 600 ml (20 oz) beaker with an inside diameter of approx. 8.5 cm (3-1/2 in.) and made of an electrically nonconductive material such as glass or plastic.
   The placing of this standard load in the oven is important not only to protect the oven, but also to insure that any leakage is measured accurately.
4) Set the cooking control on Full Power Cooking Mode.
5) Close the door and select a cook cycle of several minutes. If the water begins to boil before the survey is completed, replace it with 275 ml of cool water.

C. Leakage test:

Closed-door leakage test (microwave measurement):
1) Grasp the probe of the survey instrument and hold it perpendicular to the gap between the door and the body of the oven.
2) Move the probe slowly, not faster than 1 in./sec. (2.5 cm/sec.) along the gap, watching for the maximum indication on the meter.
3) Check for leakage at the door screen, sheet metal seams and other accessible positions where the continuity of the metal has been breached (eg., around the switches, indicator, and vents).
   While testing for leakage around the door, pull the door away from the front of the oven as far as is permitted by the closed latch assembly.
4) Measure carefully at the point of highest leakage and make sure that the highest leakage is no greater than 4mW/cm^2, and that the primary interlock switch/secondary interlock relay does turn the oven OFF before any door movement.

NOTE: After servicing, record data on service invoice and microwave leakage report.

SERVICE MANUAL

SHARP

MICROWAVE OVEN

R-508HS

FOREWORD

This supplemental Manual has been prepared to provide Sharp Electronics Corp. Service Personnel with Operation and Service Information for the SHARP MICROWAVE OVEN; R-508HS.

The model R-508HS is quite similar to base models R-510HK/R-510HW (Ref.# S43M208R510HE).

Check the interlock switches and the door seal carefully. Special attention should be given to avoid electrical shock and microwave radiation hazard.

WARNING

Never operate the oven until the following points are ensured:
(A) The door is tightly closed.
(B) The door brackets and hinges are not defective.
(C) The door packing is not damaged.
(D) The door is not deformed or warped.
(E) There is no other visible damage with the oven.

Servicing and repair work must be carried out only by trained service personnel.

DANGER

Certain initial parts are intentionally not grounded and present a risk of electrical shock only during servicing. Service personnel - Do not contact the following parts while the appliance is energized;
High Voltage Capacitor, Power Transformer, Magnetron, High Voltage Rectifier Assembly, High Voltage Harness;
If provided, Vent Hood, Fan assembly, Cooling Fan Motor.

All the parts marked "*" on parts list are used at voltages more than 250V.

Removal of the outer wrap gives access to voltage above 250V.

All the parts marked "Δ" on parts list may cause undue microwave exposure, by themselves, or when they are damaged, loosened or removed.

PRODUCT DESCRIPTION
GENERAL INFORMATION
OPERATION
TOUCH CONTROL PANEL
COMPONENT REPLACEMENT AND ADJUSTMENT PROCEDURE
WIRING DIAGRAM
PARTS LIST

SHARP ELECTRONICS CORPORATION

**SHARP PLAZA, MAHWAH,
NEW JERSEY 07430-2135**

SPECIFICATION

ITEM	DESCRIPTION
PowerRequirements	120 Volts 14.3 Amperes, 1700 watts 60 Hertz Single phase, 3 wire grounded
Power Output	1200 watts (IEC 705 TEST PROCEDURE) Operating frequency of 2450MHz
Case Dimensions	Width 24" Height 13-3/8" Depth 19-1/8"
Cooking Cavity Dimensions 2.0 Cubic Feet	Width 17-3/8" Height 10-1/2" Depth 18-5/8"
Control Complement	Touch Control System Clock (1:00 - 12:59) Timer (0 - 99 min. 99 seconds) Microwave Power for Variable Cooking Repetition Rate; P-HI ..... Full power throughout the cooking time P-90 ..... approx. 90% of Full Power P-80 ..... approx. 80% of Full Power P-70 ..... approx. 70% of Full Power P-60 ..... approx. 60% of Full Power P-50 ..... approx. 50% of Full Power P-40 ..... approx. 40% of Full Power P-30 ..... approx. 30% of Full Power P-20 ..... approx. 20% of Full Power P-10 ..... approx. 10% of Full Power P-0 ..... No power throughout the cooking time Cook pads, Defrost pads, Number selection pads, Power Level pad, Timer/Clock pad,Clear pad, Reheat, Popcorn and Minute Plus, Stop/Clear, Start (Door). Yes
Safety Standard	UL Listed FCC Authorized DHHS Rules, CFR, Title 21, Chapter 1, Subchapter J

GENERAL INFORMATION

GROUNDING INSTRUCTIONS

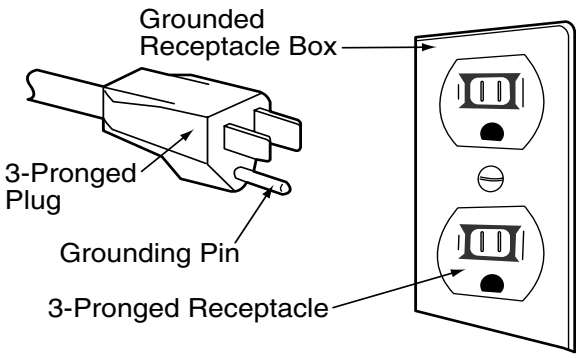
This oven is equipped with a three prong grounding plug. It must be plugged into a wall receptacle that is properly installed and grounded in accordance with the National Electrical Code and local codes and ordinances.
In the event of an electrical short circuit, grounding reduces the risk of electric shock by providing an escape wire for the electric current.

WARNING: Improper use of the grounding plug can result in a risk of electric shock.

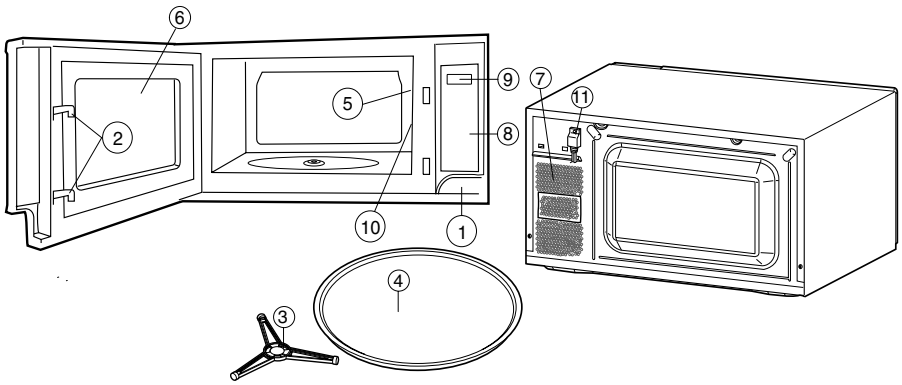
Electrical Requirements
The electrical requirements are a 120 volt 60 Hz, AC only,
15 or 20 amp. fused electrical supply. It is recommended that a separate circuit serving only this appliance be provided. When installing this appliance, observe all applicable codes and ordinances.
A short power-supply cord is provided to reduce risks of becoming entangled in or tripping over a longer cord.
Where a two-pronged wall-receptacle is encountered, it is the personal responsibility and obligation of the customer to contact

a qualified electrician and have it replaced with a properly grounded three-pronged wall receptacle or have a grounding adapter properly grounded and polarized. If the extension cord must be used, it should be a 3-wire, 15 amp. or higher rated cord. Do not drape over a countertop or table where it can be pulled on by children or tripped over accidentally.

CAUTION: DO NOT UNDER ANY CIRCUMSTANCES CUT OR REMOVE THE ROUND GROUNDING PRONG FROM THIS PLUG.



OVEN DIAGRAM



1. One touch door open button. Push to open door.
2. Door latches. The oven will not operate unless the door is securely closed.
3. Removable turntable support.
4. Removable turntable. The turntable will rotate clockwise or counterclockwise.
5. Oven lamp. It will light when oven is operating or door is opened.
6. Oven door with see-through window.
7. Ventilation openings. (Rear)
8. Auto-Touch control panel.
9. Time display: Digital display, 99 minutes 99 seconds.
10. Wave guide cover.
11. Power supply cord

NOTE:
The directed features are disabled after one minute when the oven is not in use. These features are automatically enabled when the door is opened and closed or the STOP/ CLEAR pad is pressed.

TOUCH CONTROL PANEL

R-508HS

OPERATION

DESCRIPTION OF OPERATING SEQUENCE

The following is a description of component functions during oven operation.

OFF CONDITION

Closing the door activates the door sensing switch and primary interlock switch. (In this condition, the monitor switch contacts are opened.)
When oven is plugged in, 120 volts A.C. is supplied to the control unit. (Figure O-1).

1. The display will show flashing "88:88".
   To set any program or set the clock, you must first touch the CLEAR pad/button. The display will clear, and " : " will appear.

COOKING CONDITION

Program desired cooking time by touching the NUMBER pads. Program the power level by touching the POWER LEVEL pad and then a Number pad.
When the START pad is touched, the following operations occur:

1. The contacts of relays are closed and components connected to the relays are turned on as follows.
   (For details, refer to Figure O-2)

RELAY	CONNECTED COMPONENTS
RY-1	oven lamp/turntable motor/fan motor
RY-2	power transformer

2. 120 volts A.C. is supplied to the primary winding of the power transformer and is converted to about 3.3 volts A.C. output on the filament winding, and approximately 2370 volts A.C. on the high voltage winding.
3. The filament winding voltage heats the magnetron filament and the H.V. winding voltage is sent to a voltage doubler circuit.
4. The microwave energy produced by the magnetron is channelled through the waveguide into the cavity feed-box, and then into the cavity where the food is placed to be cooked.
5. Upon completion of the cooking time, the power transformer, oven lamp, etc. are turned off, and the generation of microwave energy is stopped. The oven will revert to the OFF condition.
6. When the door is opened during a cook cycle, the monitor switch, door sensing switch, primary interlock switch, relay (RY1) and secondary interlock relay are activated with the following results. The circuits to the turntable motor, the cooling fan motor, and the high voltage components are de-energized, the oven lamp remains on, and the digital read-out displays the time still remaining in the cook cycle when the door was opened.
7. The monitor switch electrically monitors the operation of the primary interlock switch and secondary interlock relay and is mechanically associated with the door so that it will function in the following sequence.

(1) When the door opens from the closed position, the secondary interlock relay (RY2) and primary interlock switch open their contacts. And contacts of the relay (RY1) remains closed. Then the monitor switch contacts close.
(2) When the door is closed from the open position, the monitor switch contacts open first. Then the contacts of the primary interlock switch and door sensing switch close. And contacts of the relay (RY1) open.

If the primary interlock switch and secondary interlock relay (RY2) fail with the contacts closed when the door is opened, the closing of the monitor switch contacts will form a short circuit through the C/T fuse, primary interlock switch, relay (RY1) and secondary interlock relay (RY2), causing the C/T fuse to blow.

POWER LEVEL P-0 TO P-90 COOKING

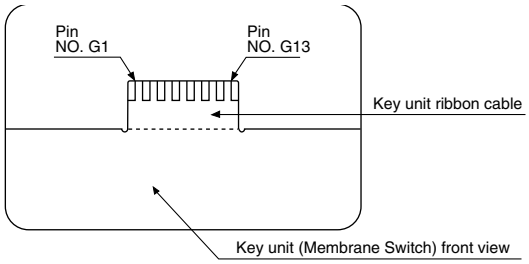
When Variable Cooking Power is programmed, the 120 volts A.C. is supplied to the power transformer intermittently through the contacts of relay (RY-2) which is operated by the control unit within a 32 second time base. Microwave power operation is as follows:

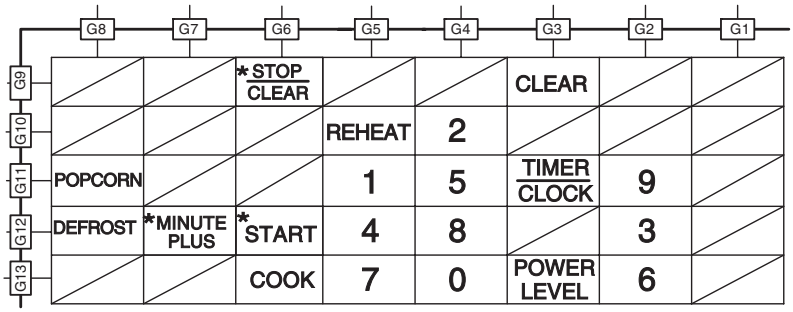
VARI-MODE	ON TIME	OFF TIME
Power 10(P-HI) (100% power)	32 sec.	0 sec.
Power 9(P-90) (approx. 90% power)	30 sec.	2 sec.
Power 8(P-80) (approx. 80% power)	26 sec.	6 sec.
Power 7(P-70) (approx. 70% power)	24 sec.	8 sec.
Power 6(P-60) (approx. 60% power)	22 sec.	10 sec.
Power 5(P-50) (approx. 50% power)	18 sec.	14 sec.
Power 4(P-40) (approx. 40% power)	16 sec.	16 sec.
Power 3(P-30) (approx. 30% power)	12 sec.	20 sec.
Power 2(P-20) (approx. 20% power)	8 sec.	24 sec.
Power 1(P-10) (approx. 10% power)	6 sec.	26 sec.
Power 0(P-0) (0% power)	0 sec.	32 sec.

Note: The ON/OFF time ratio does not correspond with the percentage of microwave power, because approx. 2 seconds are needed for heating of the magnetron filament.

TEST PROCEDURES

PROCEDURE LETTER	COMPONENT TEST





*** When door is close, key can be operated.**

Key Unit

K RELAY TEST

1. Disconnect the power supply cord, and then remove outer case.
2. Open the door and block it open.
3. Discharge high voltage capacitor.
4. Disconnect the leads to the primary of the power transformer.
5. Ensure that these leads remain isolated from other components and oven chassis by using insulation tape.
6. After that procedure, re-connect the power supply cord.
7. Remove the outer case and check voltage between the normal open terminal of the relay RY1 and the normal open terminal of the relay RY2 on the control unit with an A.C. voltmeter.
   The meter should indicate 120 volts, if not check oven circuit.
   RY1 and RY2 Relay Test
   These relays are operated by D.C. voltage
   Check voltage at the relay coil with a D.C. voltmeter during the microwave cooking operation.
   DC. voltage indicated ..... Defective relay.
   DC. voltage not indicated ..... Check diode which is connected to the relay coil. If diode is good, control unit is defective.

RELAY SYMBOL	OPERATIONAL VOLTAGE	CONNECTED COMPONENTS
RY1	Approx. 12.0V D.C.	Oven lamp / Turntable motor / Cooling fan motor
RY2	Approx. 12.0V D.C.	Power transformer

8. Disconnect the power supply cord, and then remove outer case.
9. Open the door and block it open.
10. Discharge high voltage capacitor.
11. Reconnect all leads removed from components during testing.
12. Re-install the outer case (cabinet).
13. Reconnect the power supply cord after the outer case is installed.
14. Run the oven and check all functions.

L COMPU DEFROST TEST

WARNING : The oven should be fully assembled before following procedure.
(1) Open the door.
(2) Place one cup of water in the center of the turntable tray in the oven cavity.
(3) Touch the " DEFROST " pad.
(4) Touch the number pad " 2 ".
(5) Touch the number pad " 5 ".
(6) Close the door.
(7) Touch the "START " pad.
(8) The oven is in Defrost cooking condition.
(9) The oven will operate as follows

MENU	1ST STAGE		2ND STAGE		3RD STAGE	
STEAKS/CHOPS	LEVEL	TIME	LEVEL	TIME	LEVEL	TIME
0.5lb	60%	20sec.	40%	20sec.	30%	45sec.

(10) If improper operation is indicated, the control unit is probably defective and should be checked.

TOUCH CONTROL PANEL ASSEMBLY

OUTLINE OF TOUCH CONTROL PANEL

The touch control section consists of the following units.

(1) Key Unit
(2) Control Unit (The Control Unit consists of Power Unit and LSI Unit).

The principal functions of these units and the signals communicated among them are explained below.

Key Unit
The key unit is composed of a matrix, signals generated in the LSI are sent to the key unit through P20-P27.
When a key pad is touched, a signal is completed through the key unit and passed back to the LSI through P70, P71, P41, P45, P47 and AN3 to perform the function that was requested.

Control Unit
Control unit consists of LSI, reset circuit, indicator circuit, power source circuit, relay circuit, buzzer circuit, synchronizing signal circuit and back light circuit.

1) Reset Circuit
This circuit generates a signal which resets the LSI to the initial state when power is supplied.

2) Indicator Circuit
This circuit consists of 22 segments and 3 common electrodes using a Liquid Crystal Display.

3) Power Source Circuit
This circuit generates voltages necessary in the control unit from the AC line voltage.
In addition, the synchronizing signal is available in order to compose a basic standard time in the clock circuit.

Symbol	Voltage	Application
VSS	-5V	LSI(IC1)

4) Relay Circuit
A circuit to drive the magnetron, fan motor, turntable motor and light the oven lamp.

5) Buzzer Circuit
The buzzer is responsive to signals from the LSI to emit audible sounds (key touch sound and completion sound).

6) Synchronizing Signal Circuit
The power source synchronizing signal is available in order to compose a basic standard time in the clock circuit. It accompanies a very small error because it works on commercial frequency.

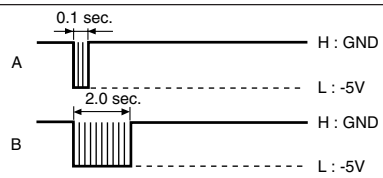
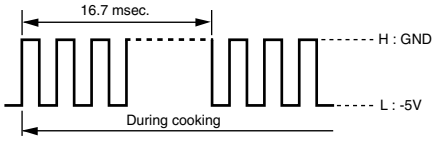
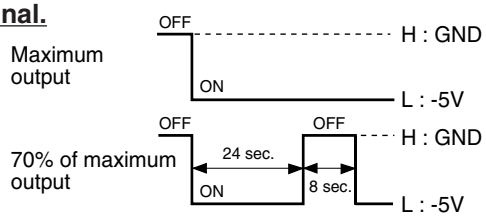
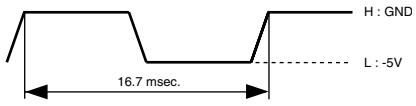
7) Door Sensing Switch
A switch to “tell” the LSI if the door is open or closed.

8) Back Light Circuit
A circuit to drive the back light (Light emitting diodes LD1-LD4).

DESCRIPTION OF LSI

LSI

The I/O signal of the LSI is detailed in the following table.

Pin No.	Signal	I/O	Description
1-2	VL2-VL1	IN	**Power source voltage input terminal.** Standard voltage for LCD.
3-6	AN7-AN4	IN	**Terminal to change cooking input according to the Model.** By using the A/D converter contained in the LSI, DC voltage in accordance with the Model in operation is applied to set up its cooking constant.
7	AN3	IN	**Signal coming from touch key.** When either G13 line on key matrix is touched, a corresponding signal out of P20 - P27 will be input into AN3. When no key is touched, the signal is held at “H” level.
8	AN2	IN	**To input signal which communicates the door open/close information to LSI.** Door close "H" level signal (0V). Door Open "L" level (-5V).
9	AN1	IN	Terminal not used.
10	AN0	IN	Terminal not used.
11-13	P57-P55	OUT	Terminal not used.
14	CNTR0	OUT	**Signal to sound buzzer (2.0 kHz).** A: key touch sound. B: Completion sound. 
15	P53	OUT	Terminal not used.
16	P52	OUT	**Oven lamp, fan motor and turntable motor driving signal** To turn on and off shut off relay (RY1). The square waveform voltage is delivered to the RY1 driving circuit and RY2 control circuit. 
17	P51	OUT	Terminal not used.
18	P50	OUT	**Magnetron high-voltage circuit driving signal.** To turn on and off the cook relay (RY2). The signals holds “L” level during microwave cooking and “H” level while not cooking. In other cooking modes (variable cooking) the signal turns to “H” level and “L” level in repetition according to the power level. 
19	P47	IN	**Signal similar to AN3.** When either G13 line on key matrix is touched, a corresponding signal will be input into P46.
20	P46	OUT	Terminal not used.
21	P45	IN	**Signal similar to AN3.** When either G12 line on key matrix is touched, a corresponding signal will be input into P45.
22-23	P44-P43	OUT	Terminal not used.
24	INT0	IN	**Signal synchronized with commercial power source frequency.** This is the basic timing for time processing of LSI. 

Pin No.	Signal	I/O	Description
25	P41	IN	**Signal similar to AN3.** When either G11 line on key matrix is touched, a corresponding signal will be input into P41.
26	P40	IN	Connected to GND through the pull-down resistor.
27	RESET	IN	**Auto clear terminal.** Signal is input to reset the LSI to the initial state when power is applied.
28	P71	IN	**Signal similar to AN3.** When either G10 line on key matrix is touched, a corresponding signal will be input into P71.
29	P70	IN	**Signal similar to ANI3.** When either G9 line on key matrix is touched, a corresponding signal will be input into P70.
30	XIN	IN	**Internal clock oscillation frequency control input setting.** The internal clock frequency is set by inserting the ceramic filter oscillation circuit with respect to XOUT terminal.
31	XOUT	OUT	**Internal clock oscillation output.** Output to control oscillation input to XIN.
32	VSS	IN	**Power source voltage : -5.0V.** The power source voltage to the drive LSI is input to VSS terminal.
33	P27	OUT	**Key strobe signal.** Signal applied to touch-key section. A pulse signal is input to P70, P71, P41, P45, P47 and AN3 terminal while one of G8 line keys on key matrix is touched.
34	P26	OUT	**Key strobe signal.** Signal applied to touch-key section. A pulse signal is input to P70, P71, P41, P45, P47 and AN3 terminal while one of G7 line keys on key matrix is touched.
35	P25	OUT	**Key strobe signal.** Signal applied to touch-key section. A pulse signal is input to P70, P71, P41, P45, P47 and AN3 terminal while one of G6 line keys on key matrix is touched.
36	P24	OUT	**Key strobe signal.** Signal applied to touch-key section. A pulse signal is input to P70, P71, P41, P45, P47 and AN3 terminal while one of G5 line keys on key matrix is touched.
37	P23	OUT	**Key strobe signal.** Signal applied to touch-key section. A pulse signal is input to P70, P71, P41, P45, P47 and AN3 terminal while one of G4 line keys on key matrix is touched.
38	P22	OUT	**Key strobe signal.** Signal applied to touch-key section. A pulse signal is input to P70, P71, P41, P45, P47 and AN3 terminal while one of G3 line keys on key matrix is touched.
39	P21	OUT	**Key strobe signal.** Signal applied to touch-key section. A pulse signal is input to P70, P71, P41, P45, P47 and AN3 terminal while one of G2 line keys on key matrix is touched.
40	P20	OUT	**Key strobe signal.** Signal applied to touch-key section. A pulse signal is input to P70, P71, P41, P45, P47 and AN3 terminal while one of G1 line keys on key matrix is touched.
41	P17	OUT	**Back light signal.** (Light emitting diodes) driving signal
42-46	P16-P12	OUT	Terminal not used.
47-50	SEG25-SEG22	OUT	Terminal not used.
51-72	SEG21-SEG0	OUT	**Segment data signal.**

Pin No.	Signal	I/O	Description
			Connected to LCD. The relation between signals are as follows: LSI signal (Pin No.) LCD (Pin No.) LSI signal (Pin No.) LCD (Pin No.) SEG0 (72) ····· SEG 0 SEG11 (61) ····· SEG 11 SEG1 (71) ····· SEG 1 SEG12 (60) ····· SEG 12 SEG2 (70) ····· SEG 2 SEG13 (59) ····· SEG 13 SEG3 (69) ····· SEG 3 SEG14 (58) ····· SEG 14 SEG4 (68) ····· SEG 4 SEG15 (57) ····· SEG 15 SEG5 (67) ····· SEG 5 SEG16 (56) ····· SEG 16 SEG6 (66) ····· SEG 6 SEG17 (55) ····· SEG 17 SEG7 (65) ····· SEG 7 SEG18 (54) ····· SEG 18 SEG8 (64) ····· SEG 8 SEG19 (53) ····· SEG 19 SEG9 (63) ····· SEG 9 SEG20 (52) ····· SEG 20 SEG10 (62) ····· SEG 10 SEG21 (51) ····· SEG 21
73	VCC	IN	Power source voltage : GND(0V).
74	VREF	IN	**A/D converter power source voltage : GND(0V).** The power source voltage to drive the A/D converter. Connected to GND.
75	AVSS	IN	**A/D converter power source voltage : -5.0V.** The power source voltage to drive the A/D converter.
76	COM3	OUT	Terminal not used.
77	COM2	OUT	**Common data signal.** Connected to LCD signal COM1.
78	COM1	OUT	**Common data signal.** Connected to LCD signal COM2.
79	COM0	OUT	**Common data signal.** Connected to LCD signal COM3.
80	VL3	IN	**Power source voltage input terminal.** Standard voltage for LCD. Connected to GND.

OVEN LAMP AND LAMP SOCKET REMOVAL

1. Disconnect the power supply cord and remove outer case.
2. Open the door and block it open.
3. Discharge high voltage capacitor.
4. Pull the wire leads from the oven lamp socket.
5. Remove the screw from the oven lamp socket.
6. Remove the oven lamp socket from the magnetron duct.
7. Remove the oven lamp from the socket by turning the oven lamp.
8. Now, the oven lamp and the oven lamp socket are free.

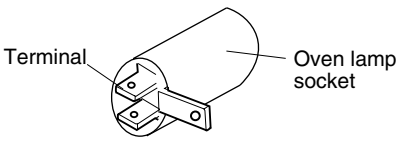


Figure C-1. Oven lamp socket

POSITIVE LOCK® CONNECTOR (NO-CASE TYPE) REMOVAL

1. Disconnect the power supply cord, and then remove outer case.
2. Open the door and block it open.
3. Discharge high voltage capacitor.
4. Push the lever of positive lock® connector.
5. Pull down on the positive lock® connector.

CAUTION: WHEN CONNECTING THE POSITIVE LOCK® CONNECTORS TO THE TERMINALS, CONNECT THE POSITIVE LOCK® SO THAT THE LEVER FACES YOU.

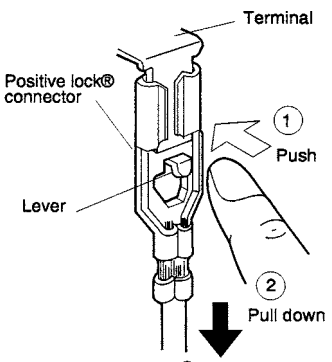


Figure C-2. Positive lock® connector

CONTROL PANEL ASSEMBLY REMOVAL

1. Disconnect the power supply cord and then remove outer case.
2. Open the door and block it open.
3. Discharge high voltage capacitor.
4. Disconnect the wire leads from panel components.
5. Remove the one (1) screw holding the control panel assembly to the oven cavity front plate.
6. Slide the control panel assembly upward and remove it.
7. Now, individual components can be removed.

NOTE: 1. Before attaching a new key unit, wipe off remaining adhesive on the control panel frame surfaces completely with a soft cloth soaked in alcohol.
2. When attaching the key unit to the control panel frame, adjust the upper edge and right edge of the key unit to the correct position of control panel frame.
3. Place the key unit firmly to the control panel frame by rubbing with soft cloth not to scratch.

GRAPHIC SHEET AND MEMBRANE SWITCH REPLACEMENT

Removal

1. Disconnect the power supply cord and then remove outer case.
2. Open the door and block it open.
3. Discharge high voltage capacitor.
4. Remove the control panel assembly, referring to chapter of CONTROL PANEL ASSEMBLY REMOVAL.
5. Remove the three (3) screws holding the control unit to the control panel frame. And remove the control unit by releasing from tabs.
6. Remove the rubber connector from the long slit on the control panel frame.
7. Remove the graphic sheet from the control panel frame. (*See special note)
8. Remove away the membrane switch from the control panel frame. (*See special note)

Removal

1. Disconnect the power supply cord and then remove outer case.
2. Open the door and block it open.
3. Discharge high voltage capacitor.
4. Remove the control panel assembly, referring to chapter of CONTROL PANEL ASSEMBLY REMOVAL.
5. Remove the graphic sheet from the control panel frame. (*See special note)

Installation

1. Remove remaining adhesive on the control panel frame surfaces with a soft cloth soaked in alcohol.
2. Make sure that the LCD sheet and the liquid crystal display in good condition.
3. Remove the backing paper from the new graphic sheet.
4. Adjust the upper edge and right edge of the graphic sheet to the large depression on the surface of the control panel frame.
5. Attach the graphic sheet to the control panel frame by rubbing with a soft cloth not to scratch.
6. Reinstall the control panel frame to the oven.

NOTE:

Do not touch the contact surface of the ribbon cable (edge) and the rubber connector with a finger directly not to be oxidized.

If display digits are missing or scrambled, remove control unit and make sure that there is not any trash or foreign substance on the contact surface of the rubber connector. Use an adhesive tape to clean the contact surface of the rubber connector.

(* Heat gun will soften adhesive.)

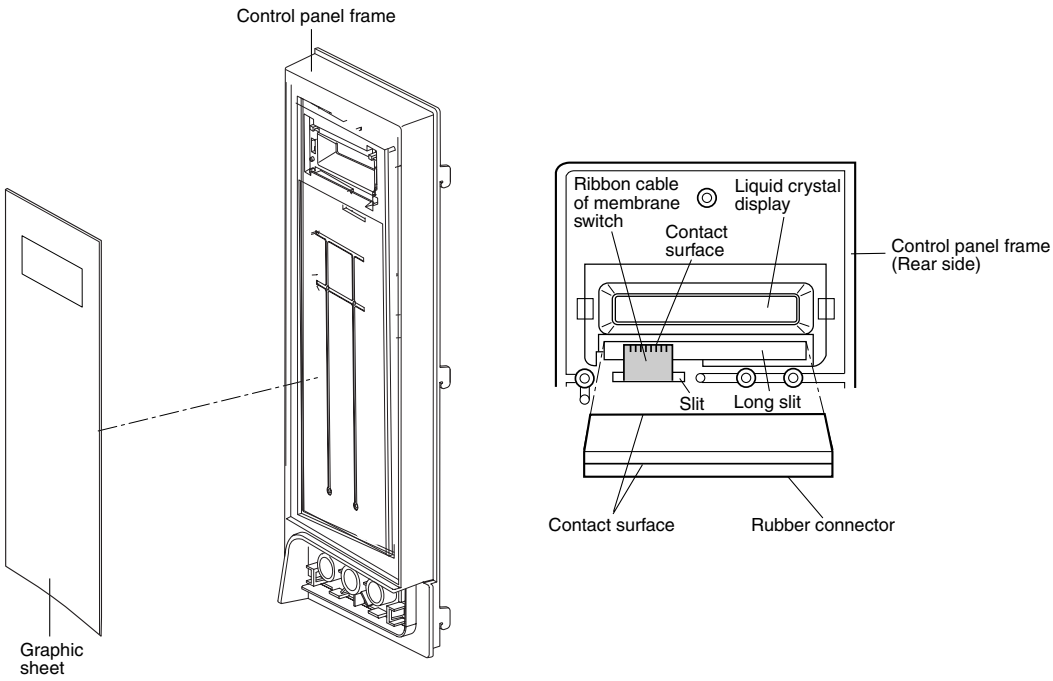


Figure C-XXX Graphic Sheet Replacement

TURNTABLE MOTOR REMOVAL

1. Disconnect the power supply cord.
2. Remove turntable and turntable support from oven cavity.
3. Lay the oven on it's backside. Remove the turntable motor cover by snipping off the material in four corners.
4. Where the corners have been snipped off bend corner areas flat. No sharp edges must be evident after removal of the turntable motor cover.
5. Disconnect wire leads from turntable motor. (See "Positive lock connector removal")
6. Remove one (1) screw holding turntable motor to oven cavity.
7. Now the turntable motor is free.
8. After replacement, use the one (1) screw provided with the TTM Kit, to attach the turntable motor cover.

COOLING FAN MOTOR REMOVAL

REMOVAL

1. Disconnect the power supply cord and then remove outer case.
2. Open the door and block it open.
3. Discharge high voltage capacitor.
4. Disconnect the wire leads from the fan motor.
5. Remove the two (2) screws holding the fan motor to the oven cavity back plate.
6. Remove the fan blade from the fan motor shaft according to the following procedure.
7. Hold the edge of the rotor of the fan motor by using a pair of groove joint pliers.

CAUTION:

* **Make sure that no metal pieces enter the gap between the rotor and the stator of the fan motor because the rotor is easily shaven by pliers and metal pieces may be produced.**
* **Do not touch the pliers to the coil of the fan motor because the coil may be cut or injured.**
* **Do not disfigure the bracket by touching with the pliers.**

8. Remove the fan blade from the shaft of the fan motor by pulling and rotating the fan blade with your hand.
9. Now, the fan blade and the fan motor will be free.

CAUTION:

* **Do not reuse the removed fan blade because the hole (for shaft) may be larger than normal.**

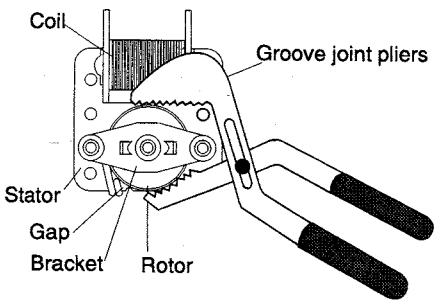
INSTALLATION

1. Install the fan blade to the fan motor shaft according to the following procedure.
2. Hold the center of the bracket which supports the shaft of the fan motor on the flat table.
3. Apply the screw lock tight into the hole (for shaft) of the fan blade.
4. Install the fan blade to the shaft of fan motor by pushing the fan blade with a small, light weight, ball peen hammer or rubber mallet.

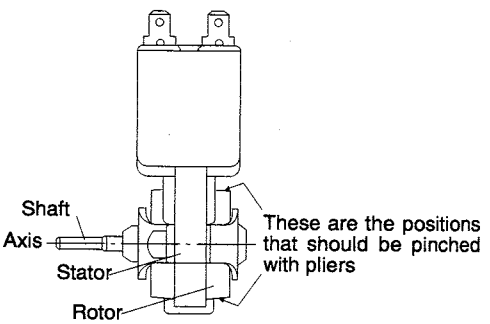
CAUTION:

* **Do not hit the fan blade strongly when installed because the bracket may be disfigured.**
* **Make sure that the fan blade rotates smooth after installation.**
* **Make sure that the axis of the shaft is not slanted.**

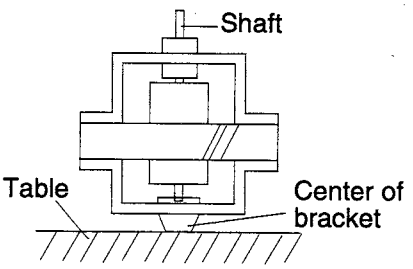
5. Install the fan motor to the oven cavity back plate with the two (2) screws.
6. Connect the wire leads to the fan motor, referring to the pictorial diagram.



Rear View



Side View



DOOR SENSING SWITCH/PRIMARY INTERLOCK SWITCH AND MONITOR SWITCH REMOVAL

1. Disconnect the power supply cord and remove outer case.
2. Open the door and block it open.
3. Discharge high voltage capacitor.
4. Disconnect wire leads from the switches.
5. Remove two (2) screws holding latch hook to oven flange.
6. Remove latch hook assembly from oven flange.
7. Push outward on the two (2) retaining tabs holding switch in place.
8. Switch is now free.
   At this time switch lever will be free, do not lose it.

Re-install

1. Re-install each switch in its place. The primary interlock/ monitor switches are in the lower position and the door sensing switch is in the upper position.
2. Re-connect wire leads to each switch.
   Refer to pictorial diagram.

3. Secure latch hook (with two (2) mounting screws) to oven flange.
4. Make sure that the monitor switch is operating properly and check continuity of the monitor circuit. Refer to chapter "Test Procedure" and Adjustment procedure.

DOOR SENSING SWITCH/PRIMARY INTERLOCK SWITCH AND MONITOR SWITCH ADJUSTMENT

1. Disconnect the power supply cord, and then remove outer case.
2. Open the door and block it open.
3. Discharge high voltage capacitor.

If the door sensing switch, primary interlock switch and monitor switch do not operate properly due to a misadjustment, the following adjustment should be made.

4. Loosen the two (2) screws holding latch hook to the oven cavity front flange.
5. With door closed, adjust latch hook by moving it back and forth, and up and down. In and out play of the door allowed by the upper and lower position of the latch hook should be less than 0.5mm. The vertical position of the latch hook should be adjusted so that the door sensing switch and primary interlock switch are activated with the door closed. The horizontal position of the latch hook should be adjusted so that the plunger of the monitor switch is pressed with the door closed.
6. Secure the screws with washers firmly.
7. Check the operation of all switches. If each switch has not activated with the door closed, loosen screw and adjust the latch hook position.

After adjustment, check the following.

1. In and out play of door remains less than 0.5mm when in the latched position. First check upper position of latch hook, pushing and pulling upper portion of door toward the oven face. Then check lower portion of the latch hook, pushing and pulling upper portion of door toward the oven face. Both results (play in the door) should be less than 0.5mm.
2. The door sensing switch and primary interlock switch interrupt the circuit before the door can be opened.
3. Monitor switch contacts close when door is opened.
4. Re-install outer case and check for microwave leakage around door with an approved microwave survey meter. (Refer to Microwave Measurement Procedure.)

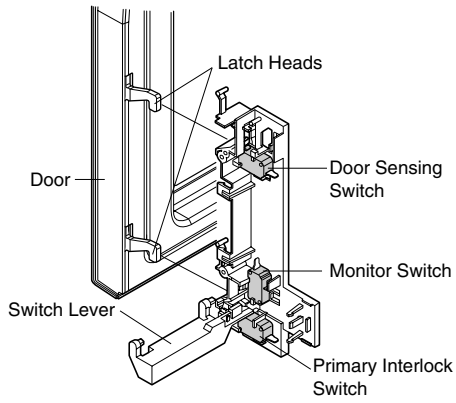


Figure C-3. Latch Switch Adjustments

DOOR REPLACEMENT

REMOVAL

1. Disconnect the power supply cord.
2. Push the open button and open the door slightly.
3. Insert a putty knife (thickness of about 0.5mm) into the gap between the choke cover and door frame as shown in Figure C-4 to free engaging parts.
4. Pry the choke cover by inserting a putty knife as shown Figure C-4.
5. Release choke cover from door panel.
6. Now choke cover is free.
7. Release two (2) pins of door panel from two (2) holes of upper and lower oven hinges by lifting up.
8. Now, door panel with door frame is free from oven cavity.

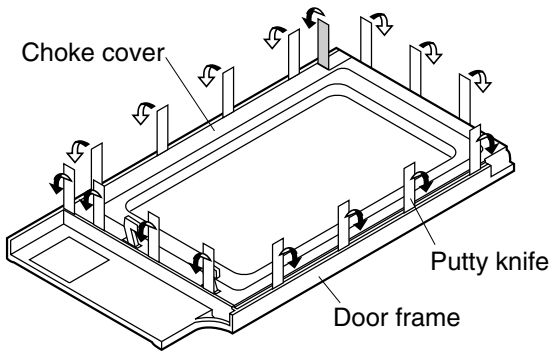


Figure C-4. Door Disassembly

9. Release the door panel from twelve (12) tabs of door frame.
10. Remove the door panel from the door frame.
11. Now, door panel with sealer film is free.
12. Tear sealer film from door panel.
13. Now, door panel is free.
14. Slide latch head upward and remove it from door frame with releasing latch spring from door frame and latch head.
15. Now, latch head and latch spring are free.
16. Remove door screen from door frame
17. Now, door frame is free.

RE-INSTALL

1. Re-install door screen to door frame.
2. Re-install the latch spring to the latch head. Re-install the latch spring to the door frame. Re-install latch head to door frame.
3. Re-install door panel to door frame by fitting twelve (12) tabs of door frame to twelve (12) holes of door panel.
4. Put sealer film on door panel. Refer to "Sealer Film" about how to handle new one.
5. Catch two (2) pins of door panel on two (2) hole of upper and lower oven hinges.
6. Re-install choke cover to door panel by pushing.

Note: After any service to the door;

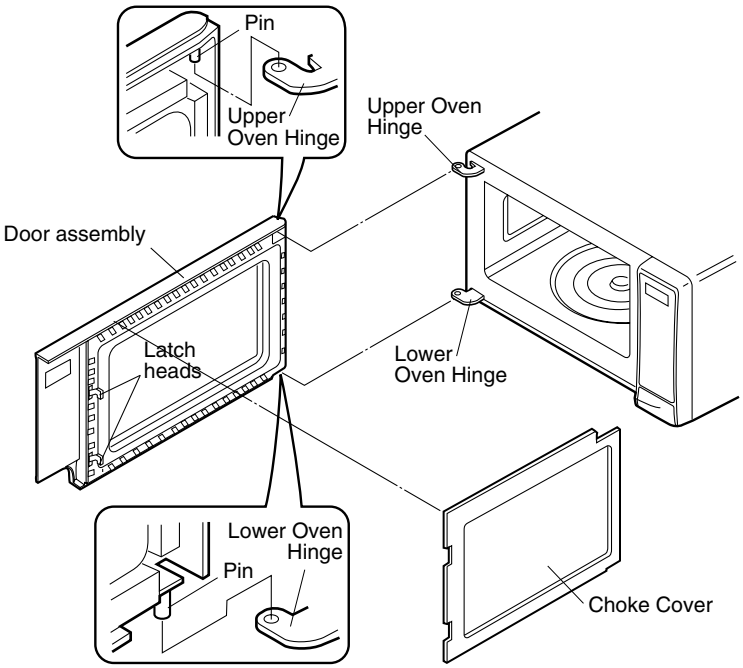
(A) Make sure that door sensing switch and primary interlock switch are operating properly. (Refer to chapter "Test Procedures".).

(B) An approved microwave survey meter should be used to assure compliance with proper microwave radiation emission limitation standards.

After any service, make sure of the following :

1. Door latch heads smoothly catch latch hook through latch holes and that latch head goes through center of latch hole.
2. Deviation of door alignment from horizontal line of cavity face plate is to be less than 1.0mm.
3. Door is positioned with its face pressed toward cavity face plate.
4. Check for microwave leakage around door with an approved microwave survey meter. (Refer to Microwave Measurement Procedure.)

Note: The door on a microwave oven is designed to act as an electronic seal preventing the leakage of microwave energy from oven cavity during cook cycle. This function does not require that door be air-tight, moisture (condensation)-tight or light-tight. Therefore, occasional appearance of moisture, light or sensing of gentle warm air movement around oven door is not abnormal and do not of themselves indicate a leakage of microwave energy from oven cavity.



Note:

When carring out any repair to the door, do not bend or wrap the slit choke (tabs on the door panel assembly) to prevent microwave leakage.

SEALER FILM

Installation

1. Put the adhesive tape on the backing film of the sealer film as shown in Fig. C-6.
2. Tear the backing film by pulling the adhesive tape.
3. Put the pasted side of the sealer film on the door panel

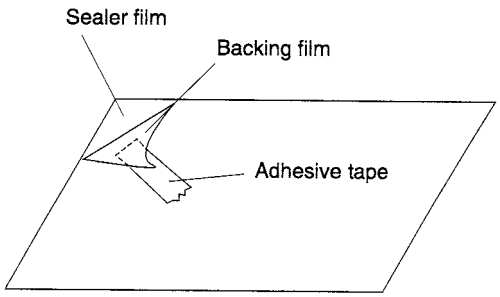


Figure C-6. Sealer film

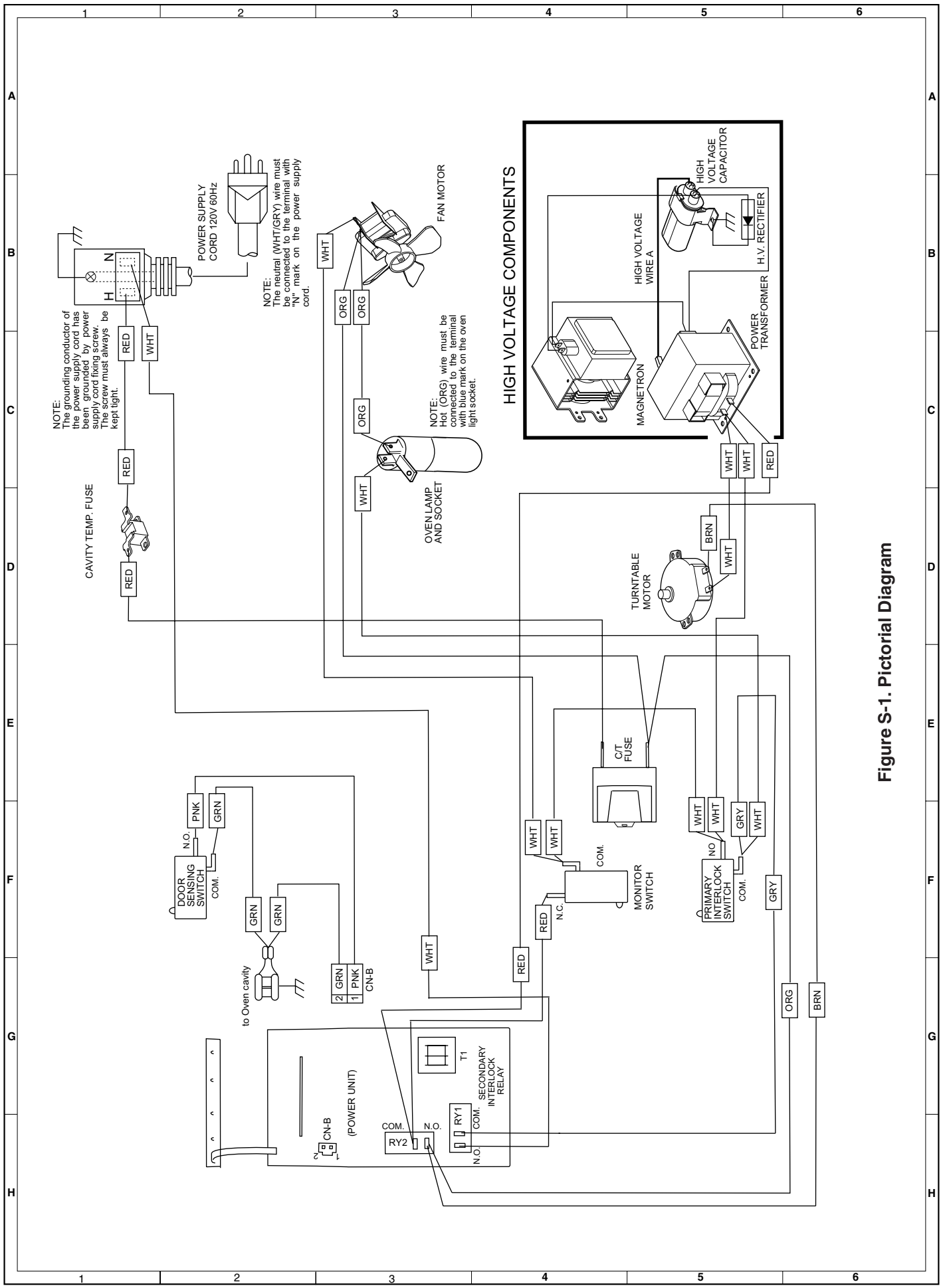


Figure S-1. Pictorial Diagram

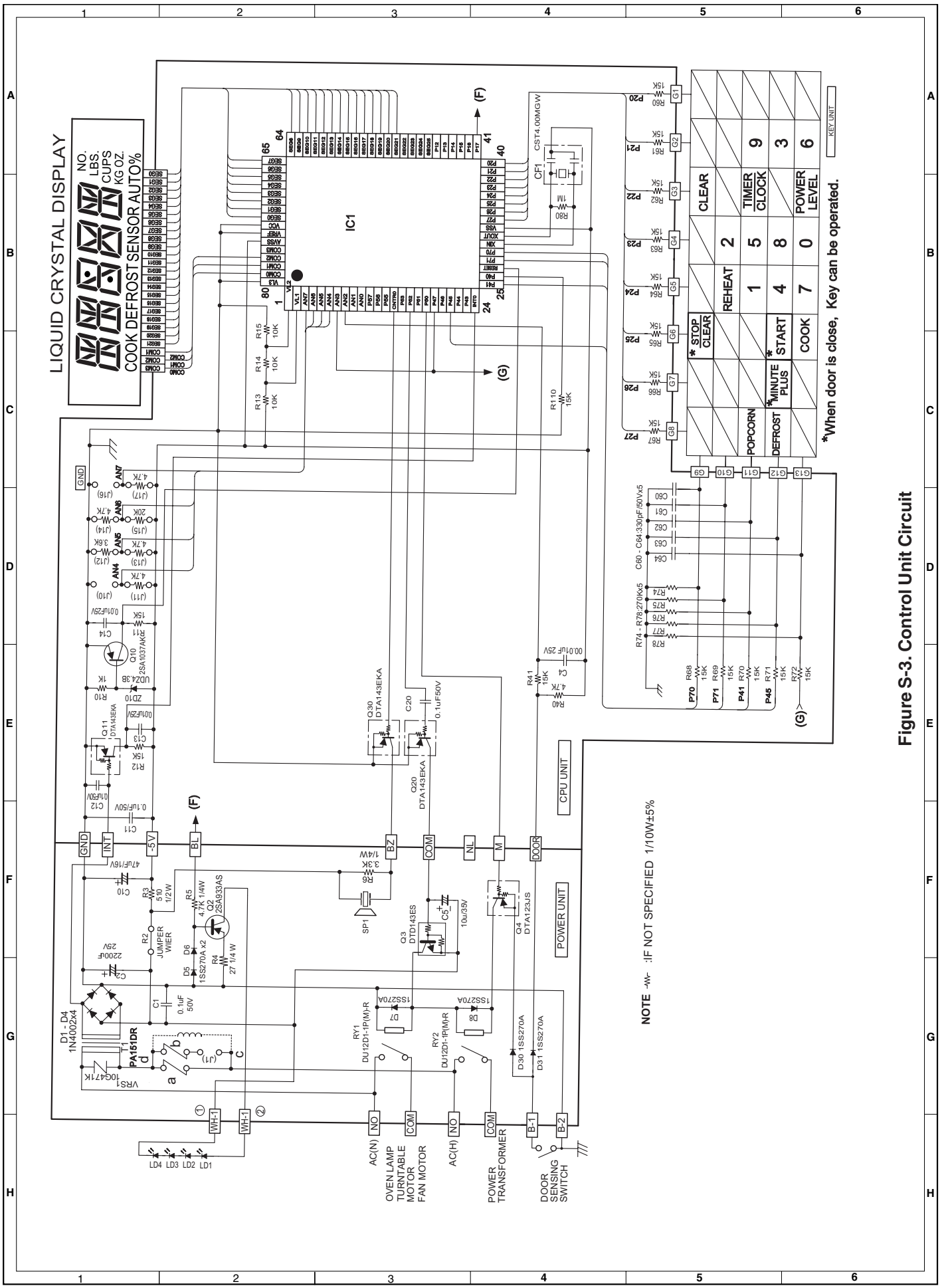


Figure S-3. Control Unit Circuit

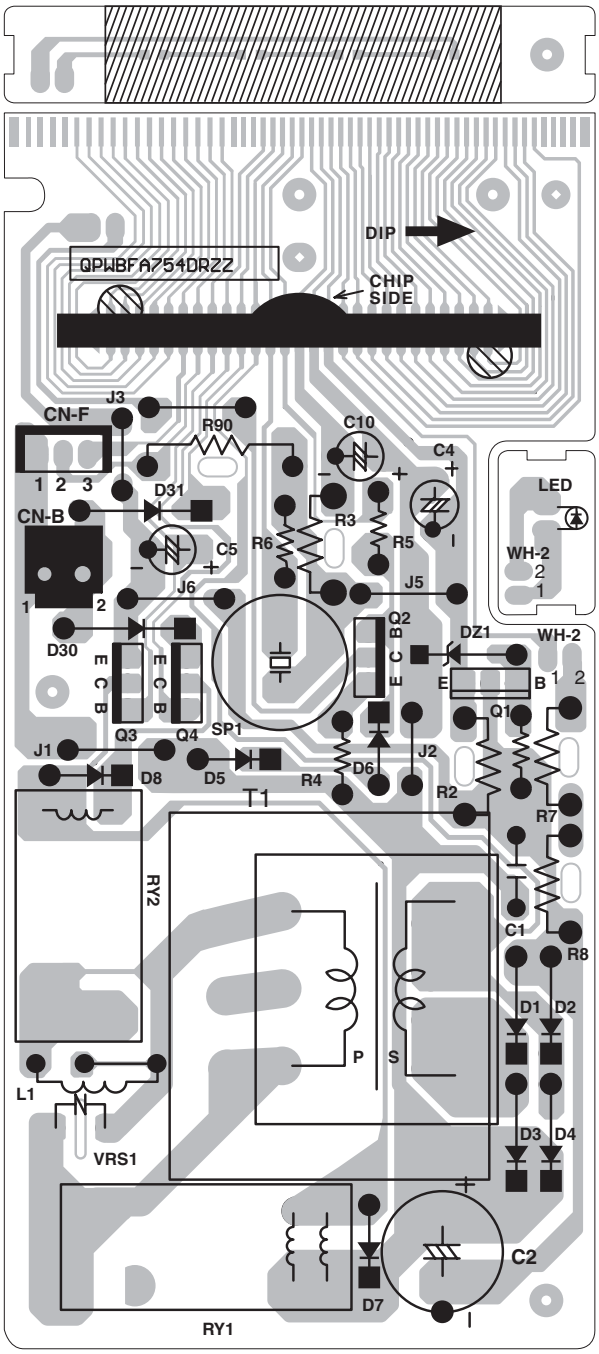


Figure S-5 . Printed Wiring Board of Power Unit

PARTS LIST

Note: The parts marked "Δ" may cause undue microwave exposure.
The parts marked "*" are used in voltage more than 250V. "§" MARK: PARTS DELIVERY SECTION.

	REF. NO.	PART NO.	§	DESCRIPTION	Q'TY	CODE
				ELECTRIC PARTS		
	1- 1	RC-QZB018MRE0	M	High voltage capacitor	1	AQ
	1- 2	FH-DZB013MRY0	M	High voltage rectifier assembly	1	AM
	1- 3	RLMPTA087WRZZ	M	Oven lamp/socket	1	AD
	1- 4	RMOTEA346WRE0	M	Fan motor	1	AR
	1- 5	FFS-BA019/KIT	M	Monitor switch (V-16G-2C25), C/T fuse (20A 250V AC) & Inst.	1	AF
	1- 6	QSW-MA085WRE0	M	Primary interlock switch and door sensing switch (V-5230Q)	2	AE
	1- 7	QFS-TA014WRE0	M	Cavity temperature fuse 150°C	1	AF
Δ	1- 8	RV-MZA293WRE0	M	Magnetron	1	BC
	1- 9	RMOTDA252/KIT	M	Turntable motor	1	AL
	1-10	RTRN-B075MRE0	M	Power transformer	1	BA
	1-11	FACCDB003MRE0	M	Power supply cord	1	AM
				CABINET PARTS		
	2- 1	GDAI-B070MRP0	M	Base plate	1	AQ
	2- 2	GLEGPB004MRF0	M	Foot	4	AB
	2- 3	GCABUB130MRP0	M	Outer case cabinet	1	BA
				CONTROL PANEL PARTS		
	3- 1	GPNLCB041/KIT	M	Control unit assy	1	AZ
	3- 2	HPNLFB008MRF0	M	Control panel sub assembly	1	AQ
	3- 3	PSHEPB128MRR0	M	Graphic sheet	1	AF
	3- 4	FDECAB046MRK0	M	Open button assy	1	AF
	3- 5	MSPRCA045WRE0	M	Open button spring	1	AA
	3- 6	XEPSD30P06XS0	M	Screw; 3mm x 6mm	5	AB
				OVEN PARTS		
	4- 1	LBNDKB007MRP0	M	H.V. Capacitor band	1	AB
	4- 2	LANGTB059MRP0	M	Chassis support	1	AG
	4- 3	PHOK-B018MRF0	M	Latch hook	1	AF
	4- 4	MLEVPB016MRF0	M	Switch lever	1	AD
	4- 5	PDUC-B125MRF0A	M	Magnetron duct	1	AE
	4- 6	NFANPB006MRE0	M	Fan blade	1	AC
	4- 7	PDUC-B088MRF0	M	Fan duct	1	AC
	4- 8	----------	M	Oven cavity (Not a replaceable part)	1	--
	4- 9	PCOVPB085MRP0	M	Waveguide cover	1	AV
	4-10	PPACGB014MRF0	M	Turntable motor packing	1	AA
	4-11	PCUSU0464MRE0	M	Cushion	1	AC
				DOOR PARTS		
	5 -1	CDORFB344MRK0A	M	Door assembly	1	BE
	5 -2	FCOV-B250MRK0	M	Door frame assembly	1	BC
	5 -3	LSTPPB021MRF0	M	Latch head	1	AE
	5 -4	MSPRTA046WRE0	M	Latch spring	1	AB
	5 -5	FDORFB075MRT0	M	Door panel	1	AX
	5- 6	PSHEPB016MRE0	M	Sealer film	1	AD
	5- 7	GCOVHB047MRF0	M	Choke cover	1	AG
	5- 8	LSTPPB045MRF0	M	Door stopper	1	AA
	5- 9	JBTN-B152MRF0	M	Button (start/stop/minute)	3	AD
	5-10	MSPRTB022MRE0	M	Button spring	3	AC

REF. NO.	PART NO.	§	DESCRIPTION	Q'TY	CODE
			MISCELLANEOUS		
6- 1	FW-VZB125MRE0	M	Stop switch harness	1	AF
6- 2	FW-VZB217MRE0	M	Main wire harnes	1	AU
6- 3	FROLPB025MRK0	M	Turntable support	1	AN
6- 4	NTNT-A099WRE0	M	Turntable tray	1	AT
6- 5	TCAUAB050MRR0	M	Monitor caution label	1	AA
6- 6	TCAUAB038MRR0	M	DHHS/Screw caution label	1	AB
6- 7	TINSEB361MRK0	M	Operation manual	1	AD
6- 8	QW-QZB016MRE0	M	High voltage wire A	1	AC
			SCREWS,NUTS AND WASHERS		
7- 1	LX-BZA041WRE0	M	Special screw	5	AA
7- 2	LX-CZ0052WRE0	M	Special screw	2	AA
7- 3	XHTSD40P12RV0	M	Screw : 4mm x 12mm	1	AA
7- 4	XOTSE40P12000	M	Screw : 4mm x 12mm	12	AA
7- 5	XCBSD30P08000	M	Screw : 3mm x 8mm	3	AA
7- 6	XHTSD40P08RV0	M	Screw : 4mm x 8mm	3	AA
7- 7	LX-CZA070WRE0	M	Special screw (Torx tamper proof screw)	2	AB
7- 8	XOTSE40P12000	M	Special screw	4	AA

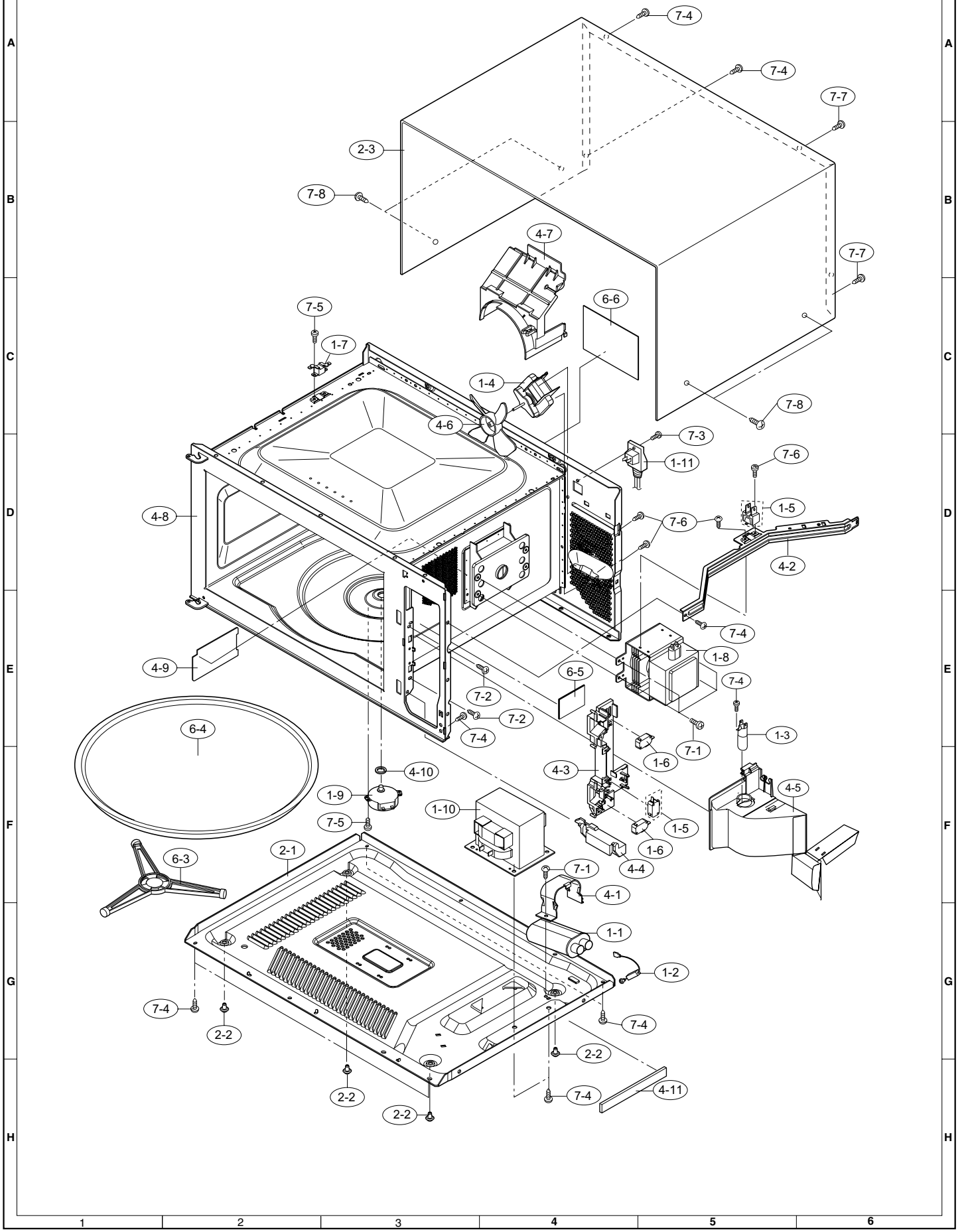
HOW TO ORDER REPLACEMENT PARTS

To have your order filled promptly and correctly, please furnish the following information.

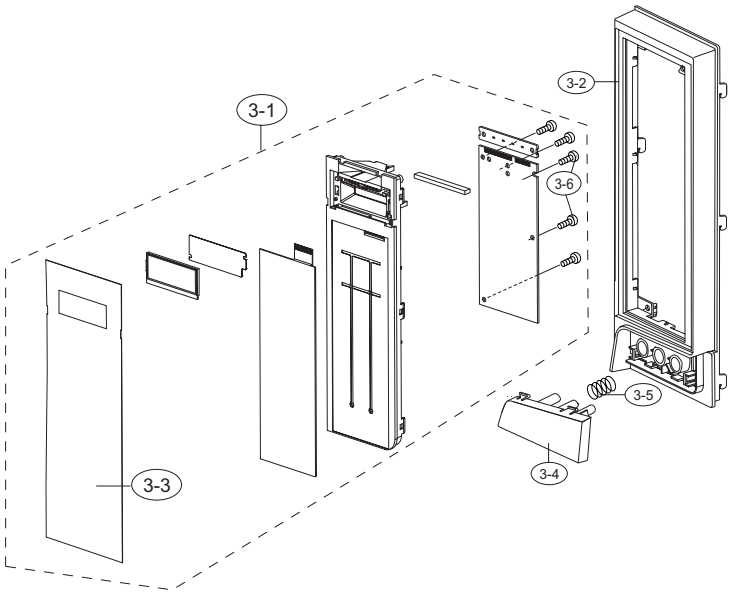
1. MODEL NUMBER
2. REF. NO.
3. PART NO.
4. DESCRIPTION

Order Parts from the authorized SHARP parts Distributor for your area.
Defective parts requiring return should be returned as indicated in the Service Policy.

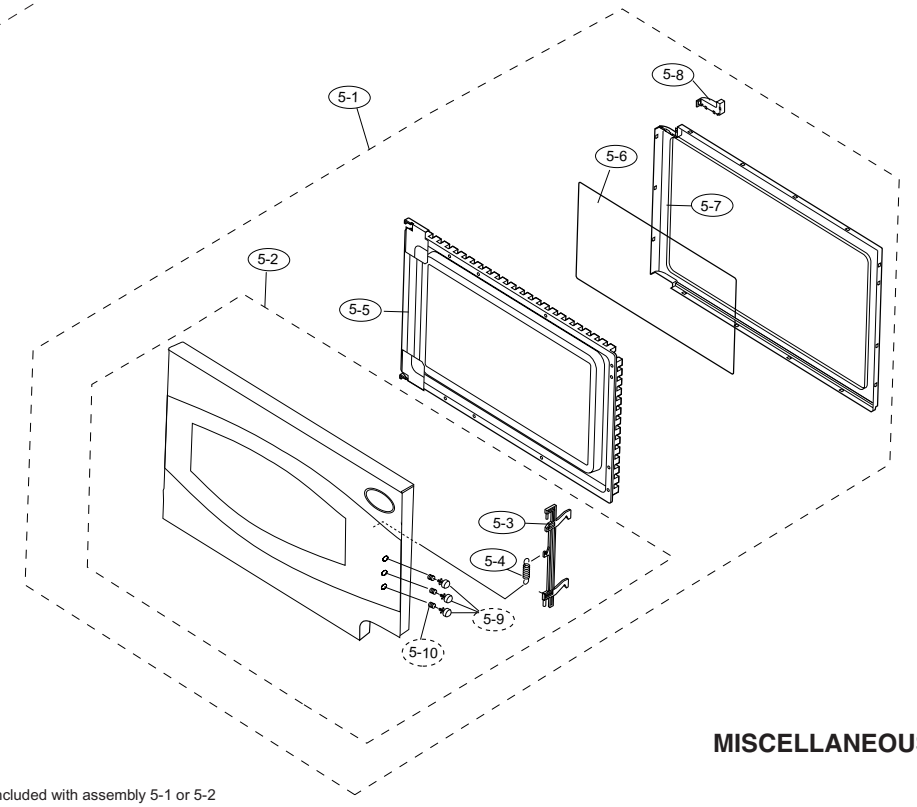
OVEN AND CABINET PARTS



CONTROL PANEL PARTS

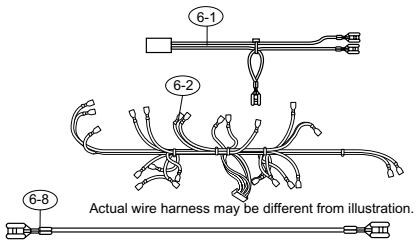


DOOR PARTS



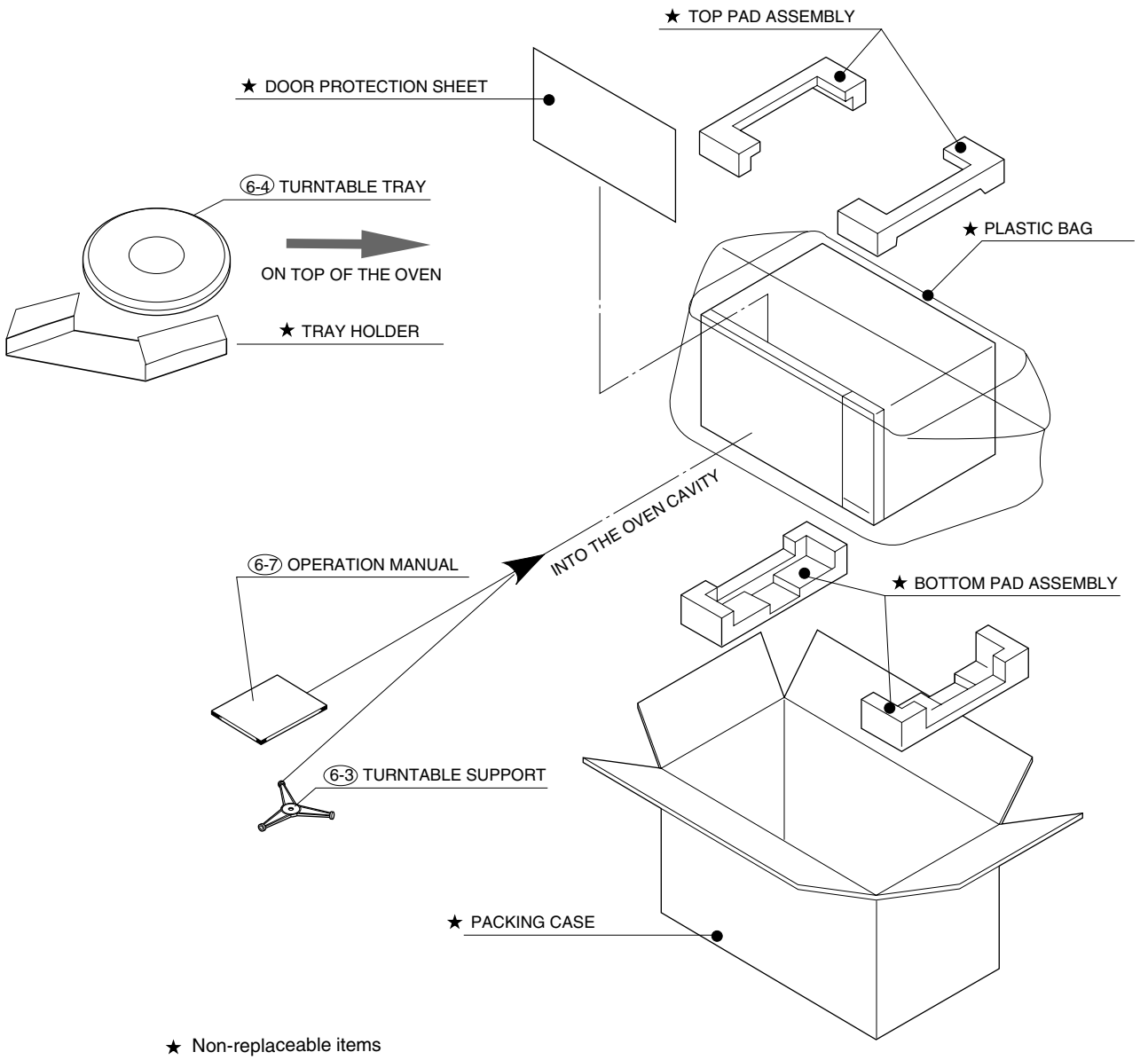
Items 5-9 & 5-10 are not included with assembly 5-1 or 5-2

MISCELLANEOUS



Actual wire harness may be different from illustration.

PACKING AND ACCESSORIES



★ Non-replaceable items

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